of different prior art references is respectfully traversed. These claims now contain the limitations of original Claim 2, not subject to the rejection. Accordingly, it is respectfully requested that the rejection be withdrawn.

The rejection of Claims 1-10 under 35 U.S.C. § 103(a) as unpatentable over JP 03-266706 (Yokohama) in view of U.S. 2,701,191 (Laliberte), is respectfully traversed. withdrawn 11/15/02

The present invention relates to a composition for a polishing pad and a polishing pad using the same, and this polishing pad can be suitably utilized for polishing the surface of semiconductor wafer and the like.

As described in the specification under "Description of the Related Art" beginning at page 1, second paragraph, recent attention has been paid to a method for polishing which can form a surface having high flatness, known as chemical mechanical polishing (CMP). In CMP, polishing is performed by flowing down a slurry which is an aqueous dispersion in which abrasives are dispersed to the surface of a polishing pad from an upper side while sliding a polishing pad and a side to be polished. For CMP, the prior art has disclosed the use of a polyurethane foam as a polishing pad, and soluble materials dispersed in a number of resins. Further improvement in slurry retaining properties and polishing rate is required. The present invention is directed to that end.

As recited in Claim 1 as amended, the present invention is a composition for a polishing pad which comprises a water-insoluble matrix material containing a crosslinked polymer and a water-soluble particle dispersed in the water-insoluble matrix material, wherein the elongation remaining after breaking is 100% or less when a test piece comprising said water-insoluble matrix material is broken at 80°C.

As described in the specification at page 3, second paragraph, the present invention is the result of studies by the inventors regarding the mechanism by which slurry retaining

properties and removal rate are gradually decreased during polishing, and the mechanism in dressing in which a pore is formed (face forming) or updated (face updating) on the surface of the polishing pad with a diamond whetstone and the like. The inventors found that an elongation produced on the surface of the matrix material and thereafter, the surface is deformed plastically, thus choking a pore, and further, dusts of not only the surface of a wafer to be polished but also the matrix material itself are produced, which also choke a pore. The inventors thus discovered that the use of a material having a cross-linking structure and manifesting elastic recovery in a matrix material successfully addresses these problems. Indeed, the importance of using a matrix material containing a crosslinked polymer is shown in the comparative data of record, wherein Examples 1 and 2 are according to the present invention, and Comparative Examples 1 and 2, which employ a non-crosslinked polymer, are for purposes of comparison. The polishing assessment of polishing performance for the Examples and Comparative Examples is described in the specification beginning at the paragraph bridging pages 26 and 27. The results are shown in Table 1 at page 28, reproduced below:

Table 1

	Example		Comparative Example	
	1	2	1	2
Removal rate (μm/min.)	190	250	60	10
State of a pore	○	○	X	X
Breaking elongation (%)	100	100	>600	>600
Breaking remaining elongation (%)	0	0	510	220

Applicants describe the results in the specification at page 29, line 1 through the end

of page 30, as follows:

> In order to measure the breaking remaining elongation of matrix materials used in Examples 1 and 2 and Comparative Examples 1 and 2, materials from which a water-soluble particle is omitted from respective Examples 1 and 2 and Comparative Examples 1 and 2 were kneaded and molded similarly to make sheets. The sheets were cut into the dumbbell No. 3 test piece shape shown in JIS K 6251 to obtain test pieces.
>
> These respective test pieces were stretched to break at a distance between marked lines of 20 mm, a stretching rate of 500 mm/min. and a test temperature of 80°C according to JIS K 6251, and the breaking remaining elongation was calculated based on the aforementioned standard. In a test piece which did not break even when stretched to a maximum 600%, the piece was forced to cut at this elongation of 600%, and the breaking remaining elongation was calculated. These breaking remaining elongation are also shown in Table 1.
>
> From the results of Table 1, in Examples 1 and 2 in which a matrix material is a crosslinked polymer, a pore is formed in the better state even after dressing. The breaking remaining elongation of matrix materials used in these polishing pads were all 0%, and it can be seen that no elongation after breaking is perceived. It can be seen that the removal rate is as high as 190 to 250 μm/min. in such the polishing pad.
>
> To the contrary, in Comparative Example 1, a non-crosslinked thermoplastic resin was used as a matrix material. It can be seen that this non-crosslinked thermoplastic resin has the very large breaking remaining elongation of 510% and, therefore, ductility. In addition, a part of pore was choked by dressing. Therefore, the removal rate is 60 μm/min. being 32% of that in Example 1 and 24% of that in Example 2. On the other hand, in Comparative Example 2, since a matrix material used in Examples 1 and 2 is used as a non-crosslinked material, the sample has not the elastic recovery. For this reason, the breaking remaining elongation is as large as 220%. In addition, a part of pore was choked by dressing. Therefore, the removal rate is 10 μm/min., being 5% of that of Example 1 and 4% of that of Example 2.

Yokohama is drawn to a rubber composition for a tire tread containing particles of a water soluble inorganic compound. Laliberte discloses a polishing pad comprising an inherently substantially abrasive-free, resilient substantially non-elastic solid member consisting essentially of vulcanized and plasticized base material, and which material contains a compatible thermoplastic vinyl resin that is substantially uniformly dispersed therethrough, and wherein the member further contains particles of material selected from the group consisting of corn cob, wood flours, serium oxide and mixtures thereof substantially uniformly distributed therethrough. See Claim 1 therein.

Without the present disclosure as a guide, it is not clear why one skilled in the art

would combine disclosures for a tire tread and disclosures for a polishing pad. Nor does either reference, or the combination thereof, disclose or suggest an elongation remaining after breaking of 100% or less when a test piece comprising the water-insoluble matrix material is broken at 80°C. As described above, the present invention can prevent finely divided pieces scraped from the polishing pad during polishing and during surface renewal or elongation from choking pores. Yokohama is concerned with a tire tread used on cold roads having a temperature around 0°C covered in ice and water, wherein Yokohama's tire has improved ice friction performance without losing abrasion resistance and without generating environmental pollution. What possible reason could there be for one skilled in the art seeking to improve Yokohama go to the art of polishing pads? It is submitted that there is no good reason. Nor would one skilled in the art seek to use the tire tread composition of Yokohama to make a polishing pad. Indeed, it is seriously doubted that persons skilled in the art of polishing pads would even go to the tire tread art. Yokohama is nonanalogous art.

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992) **(copy enclosed)**. See also MPEP 2141.01(a). Yokohama fails on both scores, since it is not from the same field of endeavor, and is not reasonably pertinent to the particular problem with which the inventor is involved.

New Claims 17-19 are separately patentable. These claims require the use of a specific organic water-soluble particle. Yokohama, on the other hand, is limited to an inorganic compound-based particle. Moreover, the corn cob, wood flours and serium oxide

of Laliberte are not organic water-soluble particles.

For all the above reasons, it is respectfully requested that the rejection over Yokohama in view of Laliberte be withdrawn.

The rejection of Claims 3, 4, 8, 9 and 12 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. With regard to Claims 4, 9 and 12, it is clear that the water-soluble particle is either an organic water-soluble particle, an inorganic water-soluble particle, or a mixture of organic and inorganic water-soluble particles. With regard to Claims 3 and 8, it is clear that the term "one" in the term "one selected from the group consisting of..." means one of the recited members of the Markush group. There is nothing indefinite about any of the rejected claims. Accordingly, it is respectfully requested that this rejection be withdrawn.

Applicants respectfully call the Examiner's attention to the Information Disclosure Statement (IDS) filed August 29, 2001. The Examiner is respectfully requested to initial the Form PTO 1449 submitted therewith, and include a copy thereof with the next Office communication.

Moreover, since the date of the IDS is before the date of the Office Action and thus technically was part of the Official file as of the Office Action date, Applicants respectfully request that should the Examiner determine that a new ground of rejection needs to be made in the next Office Action relying in whole or in part on any of the references cited in the IDS, then said next Office Action not be made Final, even if the new rejection was necessitated by the present amendment to the claims.

All of the presently pending and active claims in this application are now believed to be in immediate condition for allowance. The Examiner is respectfully requested to

withdraw the restriction requirement, and in the absence of further ground of rejection, pass this application to issue with all pending claims.

Respectfully submitted,

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IN THE CLAIMS

1. (Amended) A composition for a polishing pad which comprises a water-insoluble matrix material containing a crosslinked polymer and a water-soluble particle dispersed in the water-insoluble matrix material, wherein the elongation remaining after breaking is 100% or less when a test piece comprising said water-insoluble matrix material is broken at 80°C.

2. (Canceled).

3. (Amended) The composition for a polishing pad according to claim [2] 1, wherein said water-insoluble matrix material is modified with at least one selected from the group consisting of an acid anhydride group, a carboxyl group, a hydroxyl group, an epoxy group and an amino group.

11. (Amended) [The composition for a polishing pad according to claim 1] A composition for a polishing pad which comprises a water-insoluble matrix material containing a crosslinked polymer and a water-soluble particle dispersed in the water-insoluble matrix material, wherein said water-soluble particle is provided with an outer shell for inhibiting moisture absorption in at least a part of the outermost part.

17-19. (New).